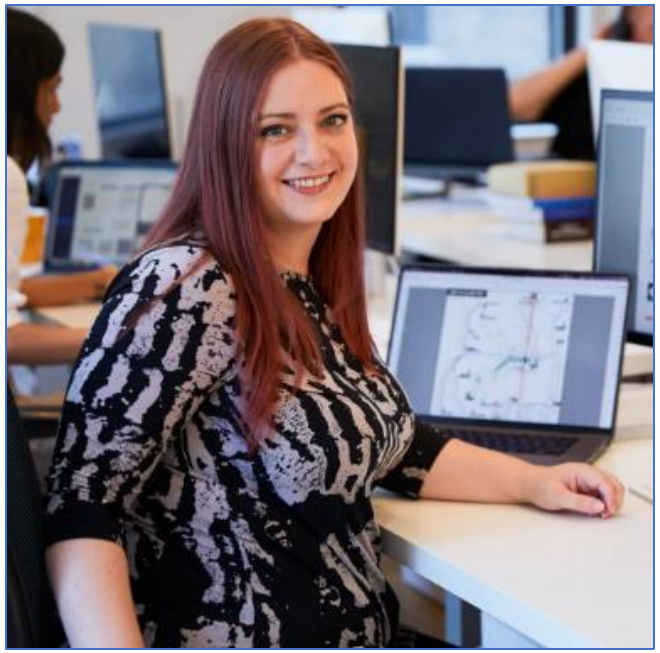
Solving The New Sign Contrast Formula

What Sign Designers Need To Know About The New A117.1 Accessibility Standard

November 6, 2024

INTERNATIONAL SIGN ASSOCIATION

Today's Presenters



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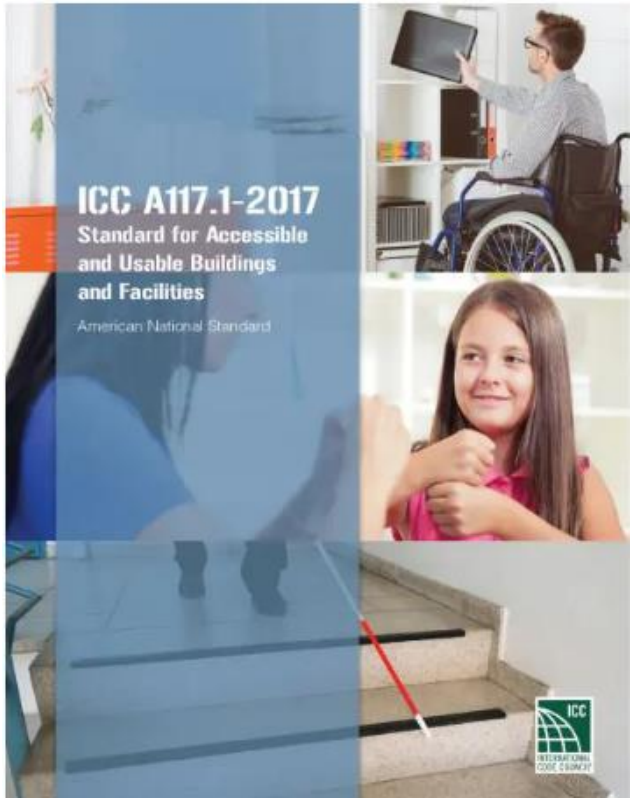
Overview of Today's Presentation

- Explaining ICC A117.1 Standard
- Sign Contrast Rule
- The Big Questions
- Other Proposed Changes
  - Text Orientation
  - Braille Position
  - Standing Space
- Next Steps

Note: The information presented in this presentation is currently under final review by the A117.1 Committee and is not currently enforceable.

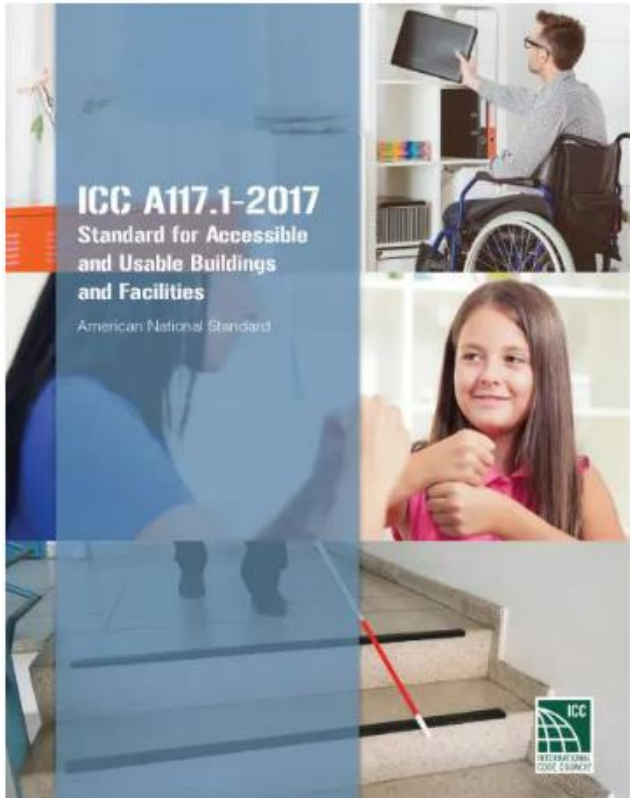
Explaining the ICC A117.1 Standard

- ICC A117.1 “Standard for Accessible and Usable Buildings and Facilities”
- Requirements for accessible buildings and facilities
  - Filter down into the International Building Code and your locally adopted building code
- Coordinates between this standard, Fair Housing guidelines, ADA Standards for Accessible Design & Architectural Barriers Act



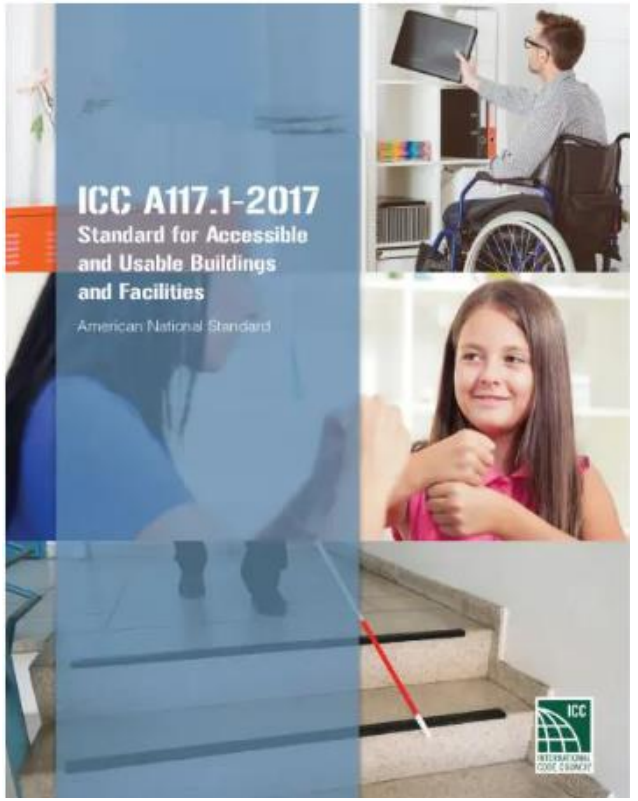
Explaining the ICC A117.1 Standard

- Managed by ICC, overseeing a 50-person committee
- Committee updates A117.1 Standard every 5(+) years
- Committee includes broad group of stakeholders:
  - ISA & SEGD
  - Building Officials (state governments, building inspectors)
  - Technical Experts (engineers, architects, designers)
  - Affected Users (paralyzed veterans, blind, deaf, brain injury)
  - Equipment Manufacturers (stairs, elevators, plumbing)
  - Facility Operators (Theatres, hotels, convenience stores)
  - Federal Agencies (USDA, HUD, Access Board)
  - Etc.



Explaining the ICC A117.1 Standard

- Committee has met since February 2022 (biweekly; 4 hrs every other Thursday, on WebEx) with ISA & SEGD attending each session
  - First Draft (public inputs submitted by April 2021; draft report complete May 2023)
    - No consensus on sign contrast or contrast definitions
    - Communications Task Group meeting from May 2022-
  - Second Draft (public comments submitted by July 2023; draft report circulated September 2024)
    - Consensus reached on sign contrast & contrast definitions April 2024
- Draft report circulated for formal balloting
  - If approved (and any unresolved issues then settled), 2025 ICC A117.1 Standard will undergo final editorial review and be published in early 2025



Sign Contrast – Existing Rule

2017 A117.1 Rule "Visual Character Finish & Contrast"

703.2.10 "Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either **light characters on a dark background**, or **dark characters on a light background**." (emphasis added)

2010 ADA Standards for Accessible Design "Finish & Contrast"

703.5.1 "Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either **light characters on a dark background** or **dark characters on a light background**." (emphasis added)

Sign Contrast – Unsuccessful Proposals

- **In accordance with British Standard 8493** (2012)
- **70% ratio, with >45 pts LRV for lighter color** (2014-16)
- **50 pts LRV simple difference between light & dark** (2023)
- **65 pts LRV simple difference between light & dark** (2024)

Sign Contrast – Proposed Rule

703.2.10.2.1 Dark and light signs. For the following sign types, visual characters shall contrast with their background, with either **light characters on a dark background**, or **dark characters on a light background**.

1. Inserts that are placed behind a translucent protective cover or signage graphics applied to the subsurface, also known as the second surface, of translucent material.
2. Signage with colors, graphics, and images applied onto the subsurface of transparent or translucent sign material.
3. Signage with colors, graphics, and images produced with Cyan Magenta, Yellow, Black (CMYK) or process color printing processes.
4. Maps.
5. Directional signs with color coded information.

703.2.10.2.2 High contrast signs. Visual characters on all other signs shall have **high contrast of 65 percent minimum** with their background as determined by the following equation:

Contrast = $\left[\frac{B1-B2}{B1}\right] x\ 100$

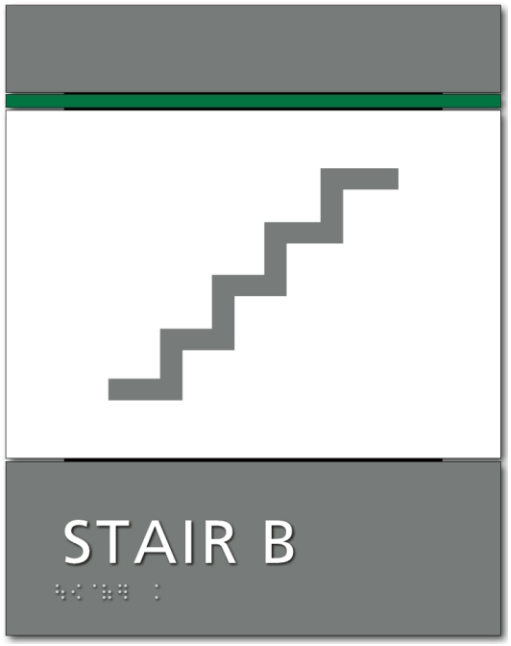
where B1 = light reflectance value (LRV) of the lighter surface; and
B2 = light reflectance value (LRV) of the darker surface.

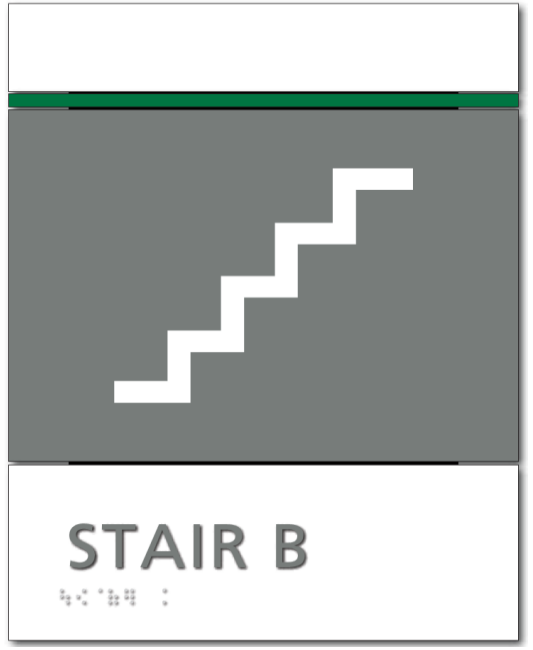
703.2.10.2.2.1 Compliance. Compliance with the Section 703.2. 101110.2.2 shall be determined by at least one of the following:

1. Documentation provided by the signage manufacturer based on information from the supplier of the material.
2. Documentation of compliance by a testing agency
3. Field measurement.

Solving Sign Contrast Formula

Dark graphics on a light or light graphics on dark background apply





Solving Sign Contrast Formula

$$\left[\frac{B1 - B2}{B1}\right] x\ 100$$

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and
B2 = Light reflectance value (LRV) of the darker surface.

Solving Sign Contrast Formula

Anodic Black
LRV: 4.3

Hi-Hide White
LRV: 88.5

Solving Sign Contrast Formula

Anodic Black
LRV: 4.3

Hi-Hide White
LRV: 88.5

$$\left[\frac{B1 - B2}{B1}\right] \times 100$$

$$\left[\frac{88.5 - 4.3}{88.5}\right] \times 100 = 95.13\%$$

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

B2 = Light reflectance value (LRV) of the darker surface.

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

B2 = Light reflectance value (LRV) of the darker surface.

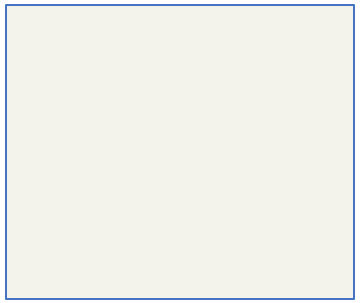
Solving Sign Contrast Formula

MTA Orange
LRV: 31.3

Verizon White
LRV: 92

Solving Sign Contrast Formula

MTA Orange
LRV: 31.3



Verizon White
LRV: 92

$$\left[\frac{92 - 31.3}{92}\right] x\ 100$$

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and
B2 = Light reflectance value (LRV) of the darker surface.

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and
B2 = Light reflectance value (LRV) of the darker surface.

Solving Sign Contrast Formula

MTA Green
LRV: 40.6

Hi-Hide White
LRV: 88.5

Solving Sign Contrast Formula

MTA Green
LRV: 40.6

Hi-Hide White
LRV: 88.5

$$\left[\frac{88.5 - 40.6}{.5412}\right] \times 100$$

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

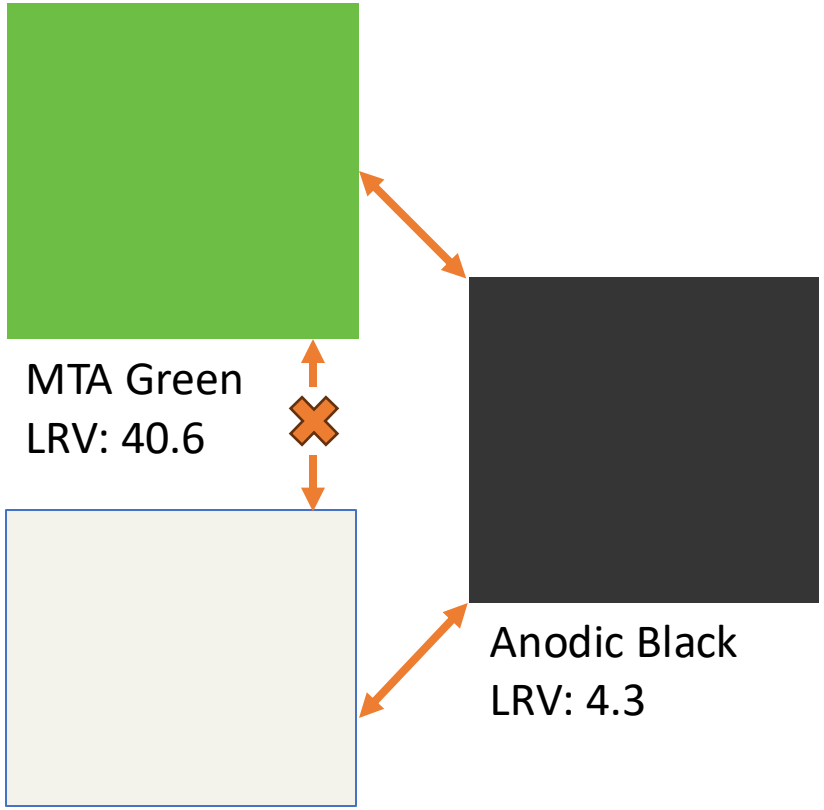
B2 = Light reflectance value (LRV) of the darker surface.

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

B2 = Light reflectance value (LRV) of the darker surface.

Solving Sign Contrast Formula



$$\left[\frac{40.6 - 4.3}{40.6}\right] x\ 100 = .894\ x\ 100$$

$$\left[\frac{88.5 - 4.3}{88.5}\right] x\ 100 = .951\ x\ 100$$

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

B2 = Light reflectance value (LRV) of the darker surface.

Where:

B1 = Light reflectance value (LRV) of the lighter surface; and

B2 = Light reflectance value (LRV) of the darker surface.

Sign Contrast -- Documentation

"Compliance…shall be determined by at least one of the following:

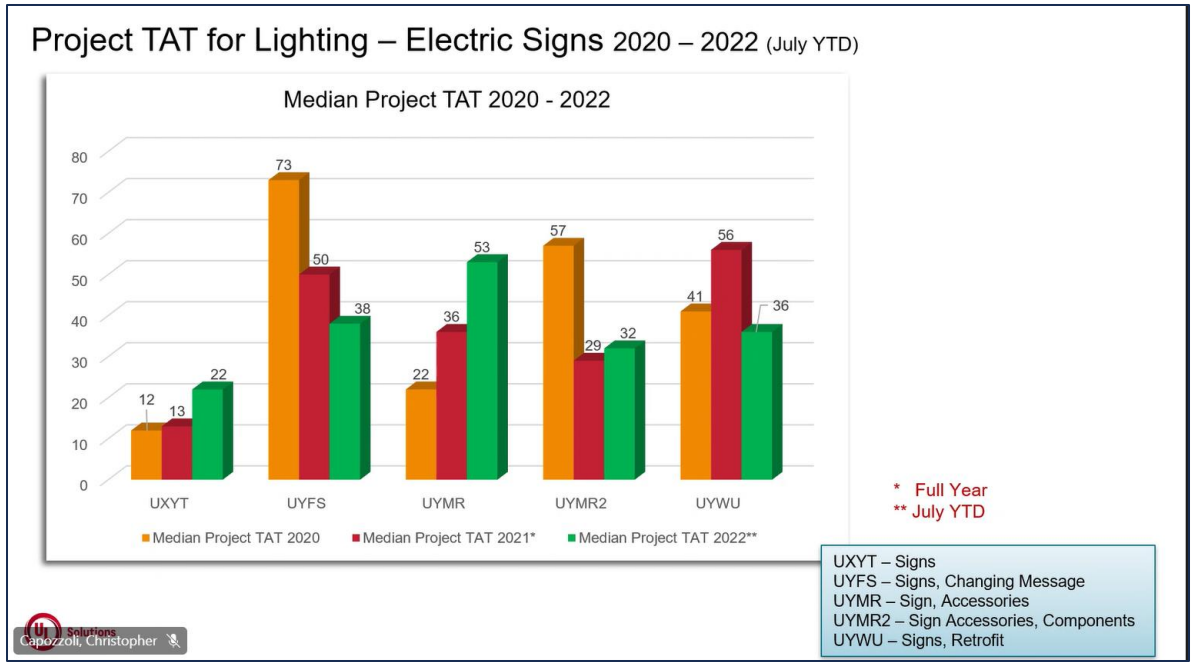
1. **Documentation provided by the signage manufacturer based on information from the supplier of the material.**
2. **Documentation of compliance by a testing agency**
3. **Field measurement"**

"Provided by the signage manufacturer based on information from the supplier of the material"

- **Who is the manufacturer of record?**
- **Who supplies the material? Stock or custom colors/finishes?**

Sign Contrast -- Documentation

- **<u>Compliance by a testing agency</u>**
  - Ship samples of completed signs to a laboratory (UL, Intertek) for evaluation
  - Cost per evaluation (every combination of materials and colors submitted)
  - Turnaround time:
    - With electric signs, 12-13 days is fast. (Info from UL Sign Industry Business Panel)



Sign Contrast -- Exceptions

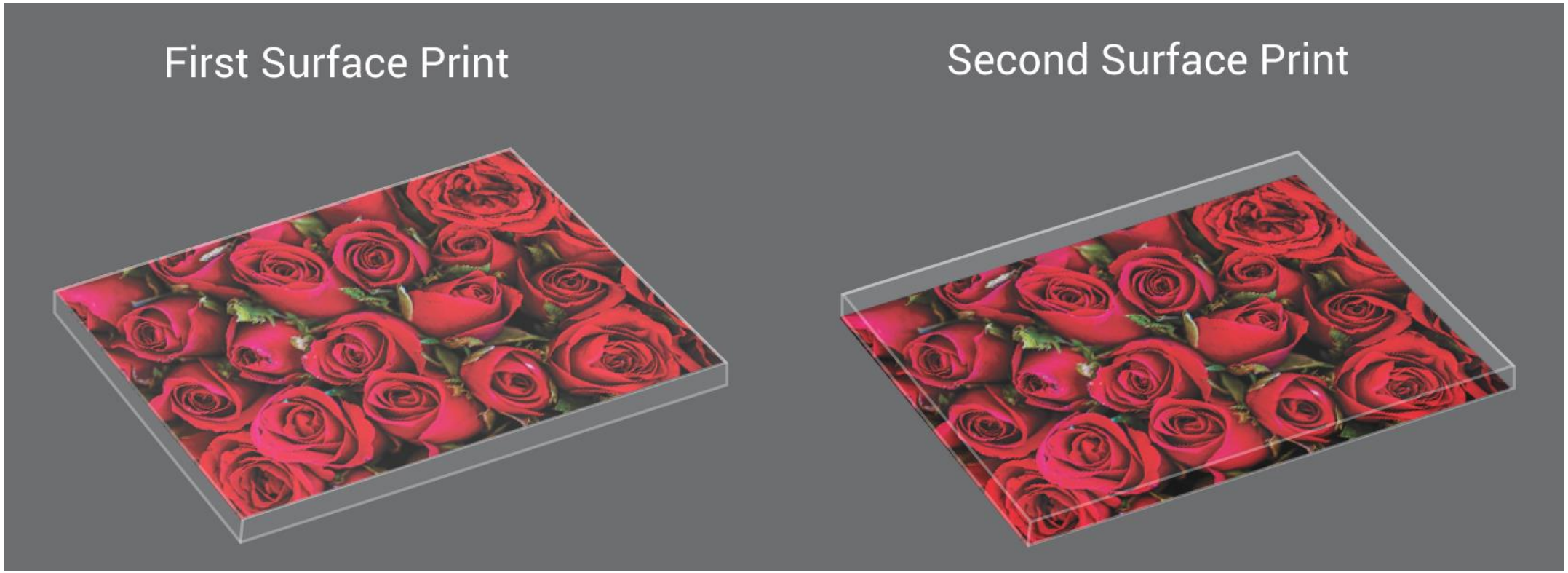
5 Sign types are exempt from the 65% contrast formula calculation:

1. Inserts placed behind translucent cover
2. Signs with colors/graphics/images applied on subsurface of translucent material
3. CMYK or Process Color Printed Signs
4. Maps
5. “Color Coded” Directional Signs

These signs must comply with the previous “light-on-dark” / “dark-on-light” requirements.

1) Inserts placed behind translucent cover

2) Signs with colors/graphics/images applied on subsurface of translucent material



3) CMYK or Process Color Printed Signs

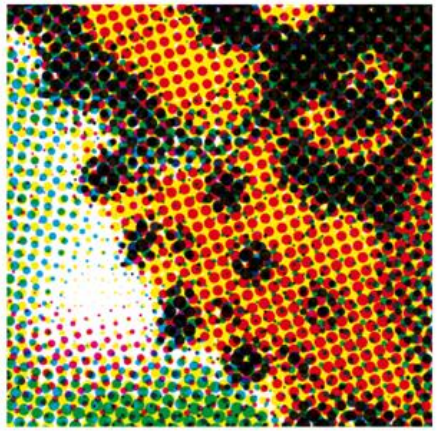
CYAN

MAGENTA

YELLOW

BLACK

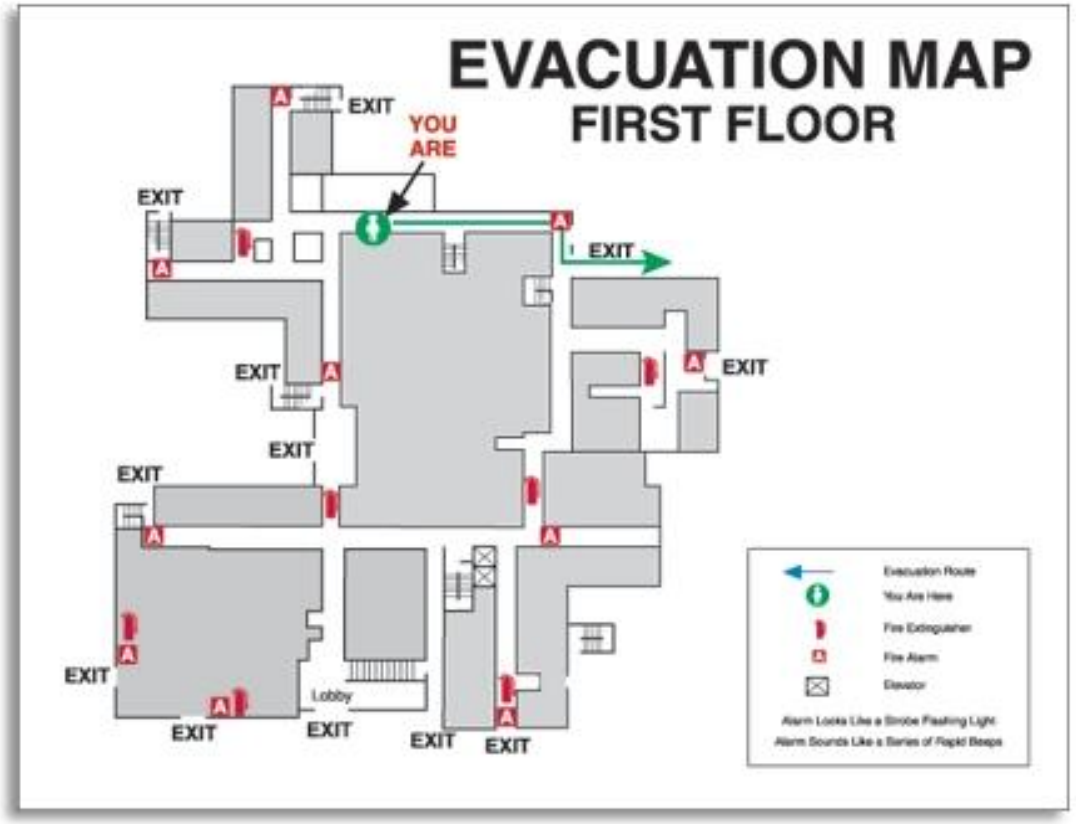
FINAL CMYK

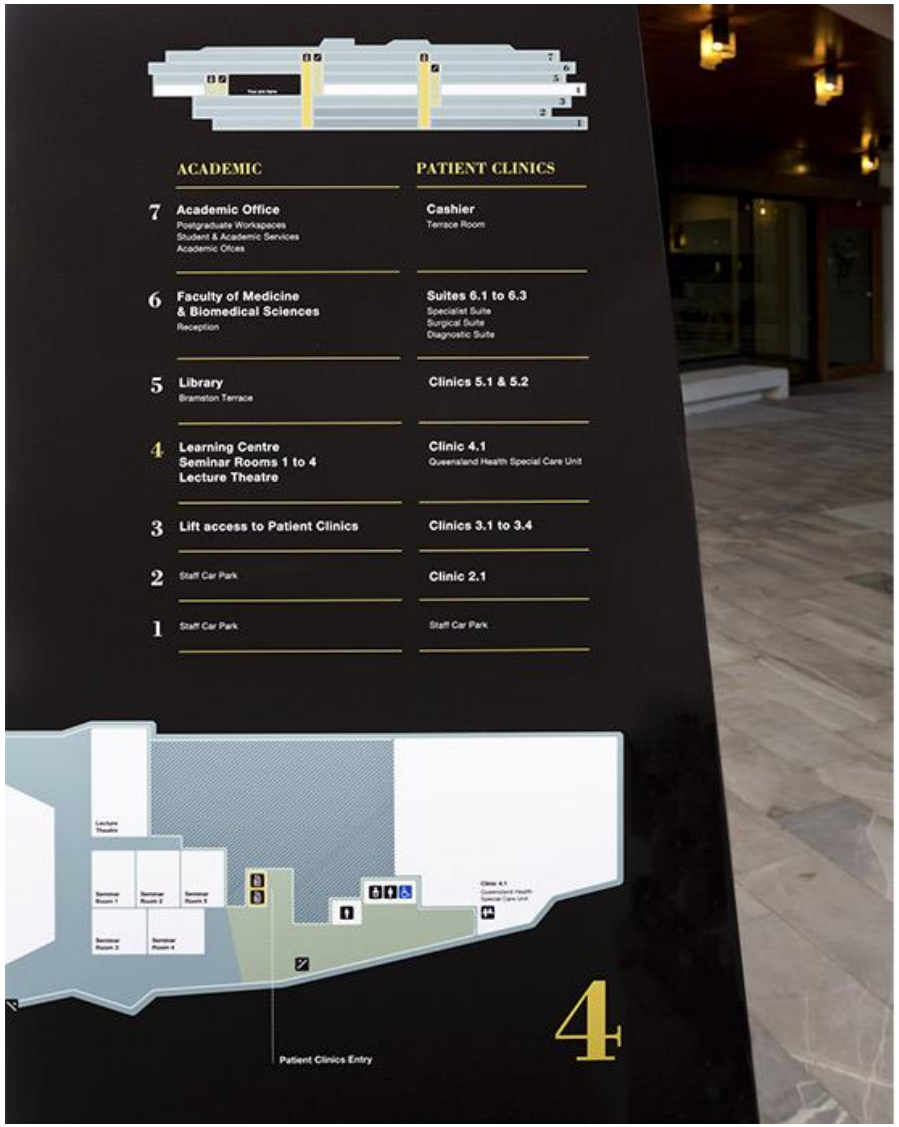


DETAIL VIEW

CMYK printed letters at 50x magnification

4) Maps


EVACUATION MAP
FIRST FLOOR
YOU ARE
EXIT
Lobby
Evacuation Route
You Are Here
Fire Extinguisher
Fire Alarm
Elevator
Alarm Looks Like a Strobe Flashing Light
Alarm Sounds Like a Series of Rapid Beeps


ACADEMIC
PATIENT CLINICS
7 Academic Office
Postgraduate Workspaces
Student & Academic Services
Academic Offices
Cashier
Terrace Room
6 Faculty of Medicine & Biomedical Sciences
Reception
Suites 6.1 to 6.3
Specialist Suite
Surgical Suite
Diagnostic Suite
5 Library
Bramston Terrace
Clinics 5.1 & 5.2
4 Learning Centre
Seminar Rooms 1 to 4
Lecture Theatre
Clinic 4.1
Queensland Health Special Care Unit
3 Lift access to Patient Clinics
Clinics 3.1 to 3.4
2 Staff Car Park
Clinic 2.1
1 Staff Car Park
Staff Car Park
Patient Clinics Entry
4

5) “Color Coded” Directional Signs

Tackling the Big Questions

Why Replace “Light-on-Dark”? It Works Fine!

Why Replace “Light-on-Dark”? It Works Fine!

“Light-on-Dark” was a temporary fix, because the committee was unable to agree in 1992…

...again in 1998…

...again in 2003…

...again in 2009…

...again in 2017…

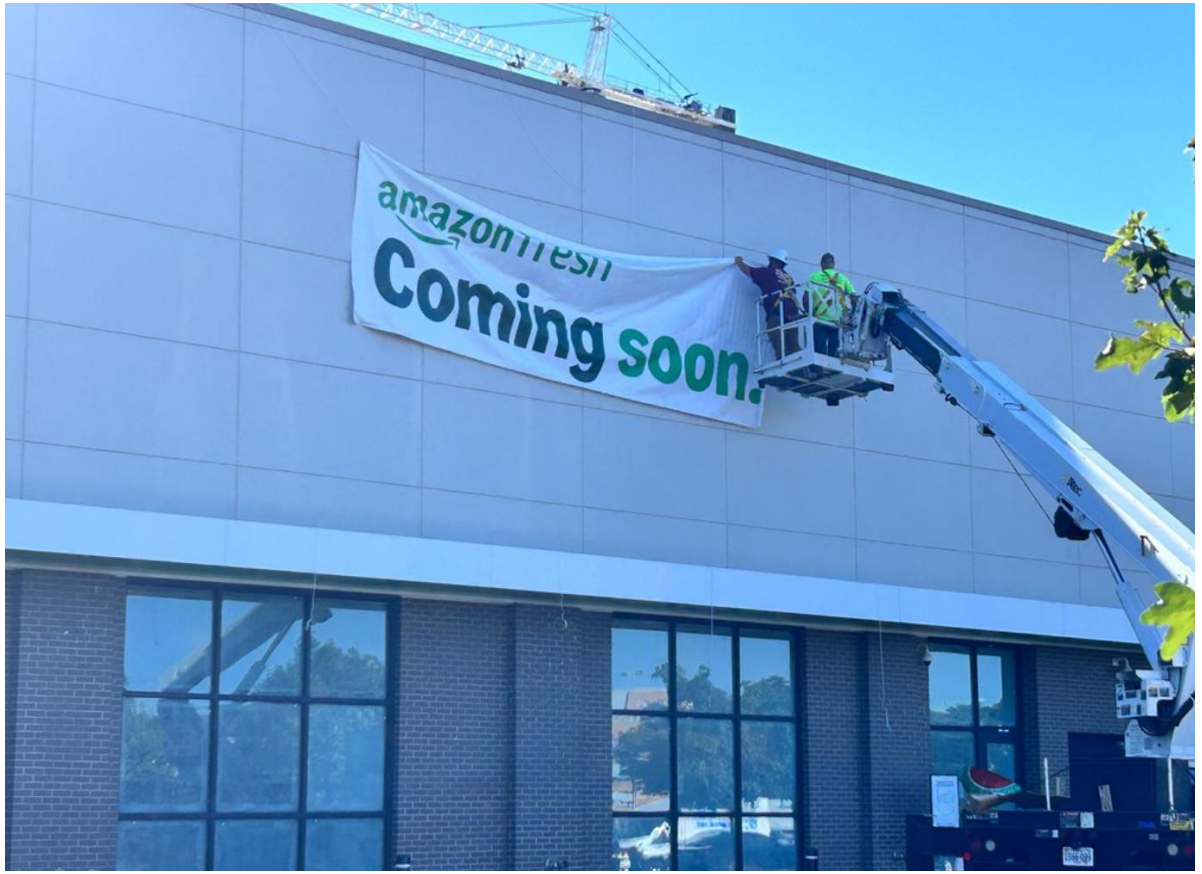


Photo: Washington Business Journal

Why replace “Light-on-Dark”? It works fine!

- Light-on-Dark barely survived 2017 code cycle. Many ballot comments about convening a work group to sort out issues and develop a measurable standard:

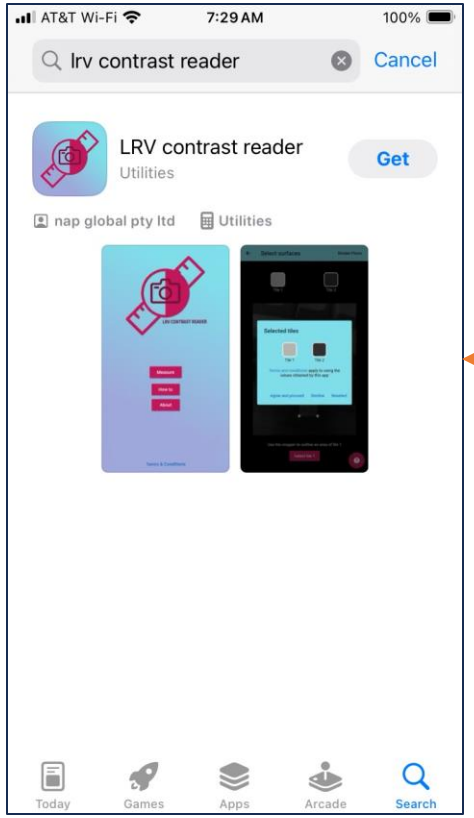
  “The perfect has been the enemy of the good for far too long regarding standards for visual contrast and glare….The US standard of light-on-dark or dark-on-light is an embarrassment that serves no one well. It is totally subjective, not measurable, and serves no sign readers well….Failure to establish this measurable, enforceable, research-based standard tells the world once again, that legibility of signs is not really important to US standards bodies.” (2016 committee comment)

- Q: Who should the contrast standard work for?
- A: This isn’t meant to help folks with 20-20 or corrected 20-40 vision. This is for people with reduced vision.

How do I measure LRV if it's not provided to us?

How do I measure LRV if it's not provided to us?

- Cost (and capability) of measurement device



Free Download

Reasonably accurate, cost effective products

$15,000+ from X-Rite

How do I measure LRV if it's not provided to us?

Moderately Priced Devices Not Intended For Sign Character Width

2mm
$1200

5mm
$500

8mm
$300

How do I measure LRV if it's not provided to us?

Measurement size presents challenges

		LRV 1 - White characters*	LRV 2 – Blue background	Weber Contrast Formula
	**Variable Spectro 1 8 mm**	36.8	7.5	79.6
	**Nix Spectro 2 – 5 mm**	34	5	85.3
	**Nix Spectro 2 – 2 mm**	72	5	93.1

Why All of These Exceptions?

Why All of These Exceptions?

Remember this slide?

Spectrometers have difficulty measuring narrow color samples

	LRV 1 - White characters*	LRV 2 – Blue background	Weber Contrast Formula
 **Variable Spectro 1 8 mm**	36.8	7.5	79.6
 **Nix Spectro 2 – 5 mm**	34	5	85.3
 **Nix Spectro 2 – 2 mm**	72	5	93.1

Why All of These Exceptions?

- Spectrometer accuracy dependent on:
  - NO outside light
  - Even color sample to measure

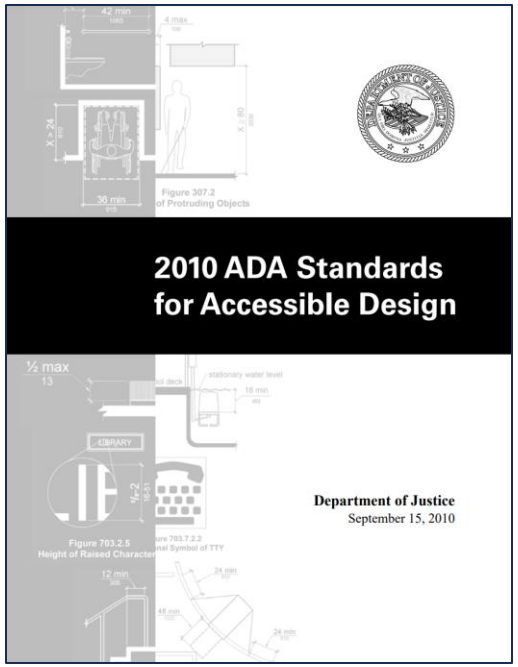
Why Follow the A117.1 Standard? What About ADA Standards for Accessible Design?

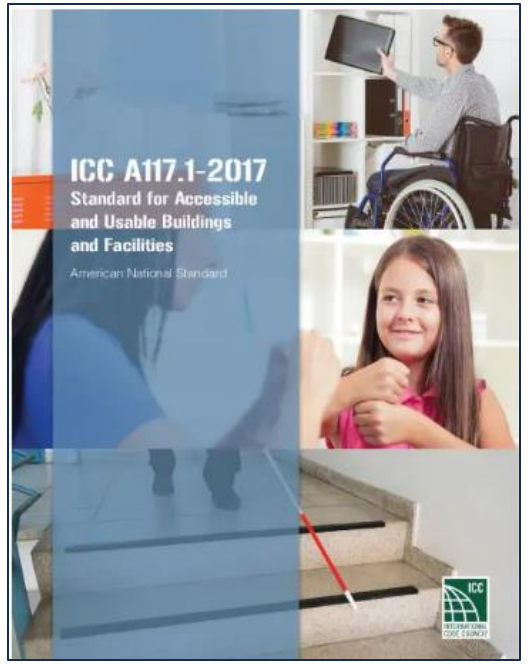
Why Follow the A117.1 Standard?
What About ADA Standards for Accessible Design?

- What we NEED to follow is federal law (Americans With Disabilities Act of 1990; 2008 amended)
- But ADA itself doesn't talk about signs
- ADA says that no individual shall be discriminated against in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation by any person who owns, leases (or leases to), or operates a place of public accommodation.
- Adapting ADA prohibition to measurable rules/requirements falls to an administrative agency

Why Follow the A117.1 Standard?
What About ADA Standards for Accessible Design?

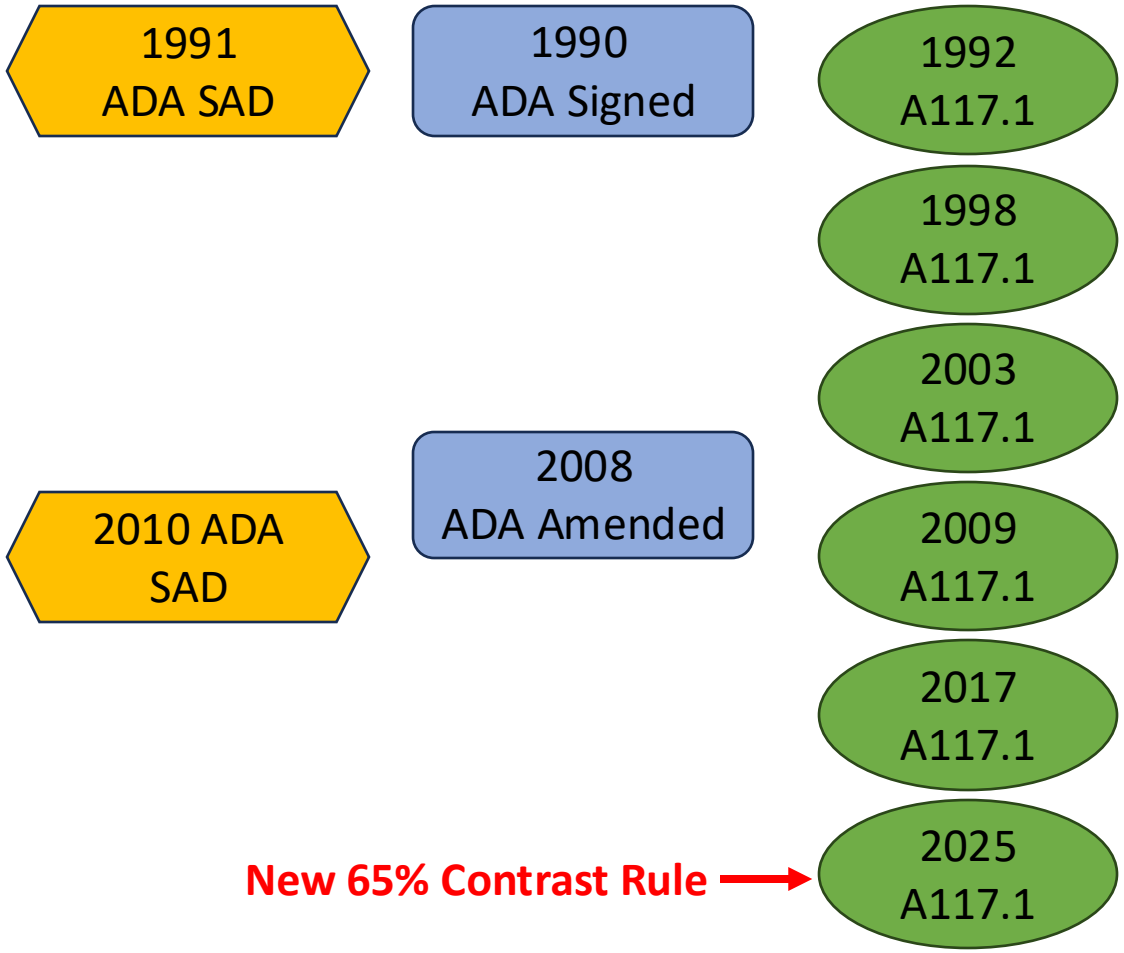
- Two parallel tracks
  - Rules for federally owned property, federally funded projects, facilities subject to federal government oversight (ADA Standards for Accessible Design, DOJ & DOT, Architectural Barriers Act)
  - Rules for state & local governments to incorporate into their laws & ordinances (locally adopted building codes, ICC A117.1)





Why Follow the A117.1 Standard?
What About ADA Standards for Accessible Design?

- From 1992-today, ADA SAD and A117.1 have said “Light-on-Dark”
- From 2025-???, different rules for sign contrast; A117.1 more rigorous



When Does This All Take Effect?

When Does This All Take Effect?

- A117.1 Standard aims for 2025 release
- This next standard will be included in 2027 International Building Code
- 2027 IBC becomes state/local law only after legislative adoption
  - No states currently enforce 2024 IBC; 20 use 2021 IBC; most others use 2012-18 editions
  - This suggests 6+ years until majority of US adopts 2027 IBC (containing enforceable sign contrast provisions)

Other A117.1 Changes for Sign Design & Installation

Text Orientation

703.2 Visual Characters

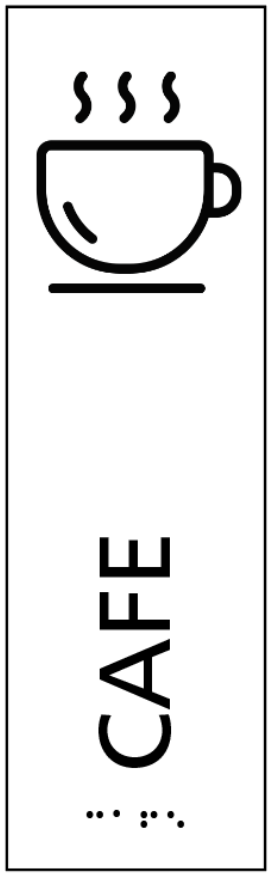
703.2.4 Text orientation: The lines of visual text characters shall be displayed with the base line of the text in either in a vertical or horizontal orientation.

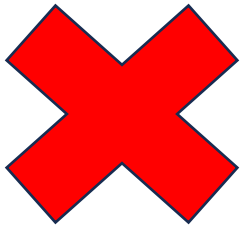
> **Exception:** Numeric characters are permitted to be displayed in a vertical orientation, one under another.

703.3 Raised characters.

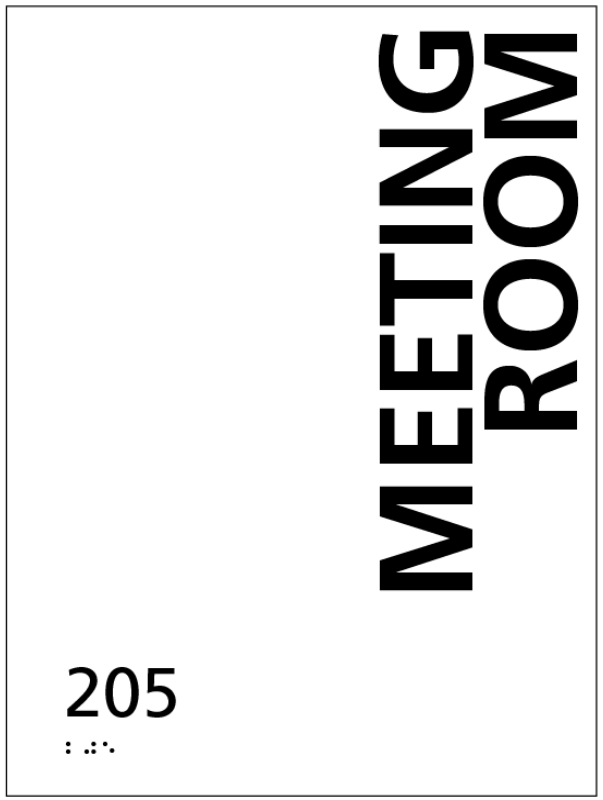
703.3.5 Text orientation: Raised characters shall be displayed in a horizontal orientation.

Text Orientation





Text Orientation

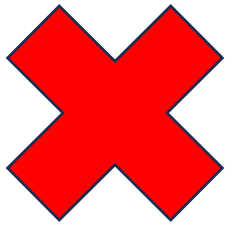


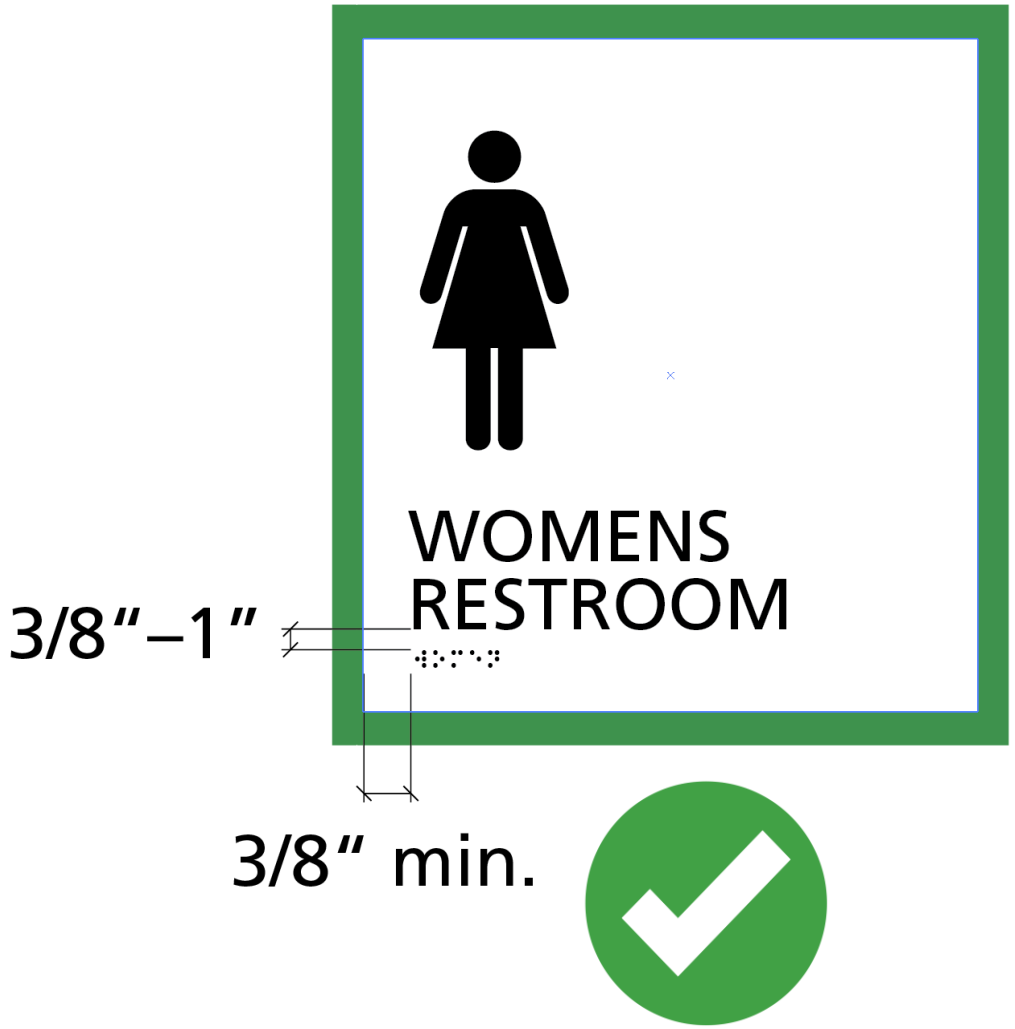
Braille Position

703.4 Braille

703.4.4 Position. Braille shall be below the corresponding text. If text is multilined, braille shall be placed below entire text. Braille shall be separated ⅜ inch (9.5 mm) minimum and 1 inch (25 mm) maximum from any other raised characters and ⅜ inch (9.5 mm) minimum from raised borders and decorative elements. Braille provided on elevator car controls shall be separated 3/16 inch (4.8 mm) minimum either directly below or adjacent to the corresponding raised characters or symbols

Braille Position





~~Clear Floor Area~~ → "Standing Space"

703.1.4 Tactile Signs

~~703.3.11~~ **703.1.4.2 Location and standing space**. Where a tactile sign ~~containing raised characters and braille~~ is provided to designate a permanent room or space, ~~at a door~~, the sign shall be located ~~alongside~~ at the doorway to the room or space it identifies and shall be installed in accordance with Table 703.1.4.2. ~~Where a sign containing raised characters and braille is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a sign containing raised characters and braille is provided at double doors with two active leaves, the sign shall be to the right of the right-hand door. Where there is no wall space on the latch side of a single door, or to the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing raised characters and braille shall be located so that a clear floor area~~. A standing space 18 inches (455 mm) minimum by 18 inches (455 mm) minimum shall be provided and shall be centered on the raised characters. The arc of any door swing between the closed position and a 45-degree open position, shall not swing into the standing space is ~~provided beyond the arc of any door swing between the closed position and 45 degree open position~~.

~~Exception: Signs containing raised characters and braille shall be permitted on the push side of doors with closers and without hold-open devices.~~

~~Clear Floor Area~~ → "Standing Space"

703.1.4 Tactile Signs

703.1.4.2 Location and standing space. Where a tactile sign is provided to designate a permanent room or space, the sign shall be located at the doorway to the room or space it identifies and shall be installed in accordance with Table 703.1.4.2. A standing space 18 inches (455 mm) minimum by 18 inches (455 mm) minimum shall be provided and shall be centered on the raised characters. The arc of any door swing between the closed position and a 45-degree open position, shall not swing into the standing space.

~~Clear Floor Area~~ → "Standing Space"

Table 703.1.4.2

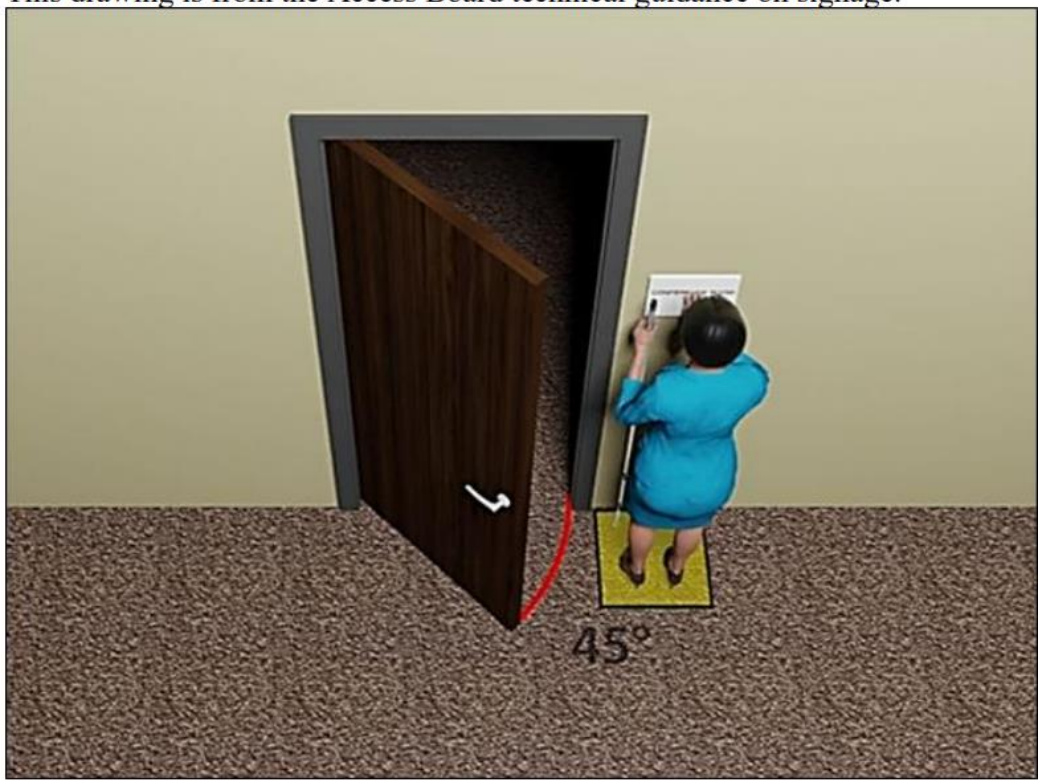
Tactile Sign Location

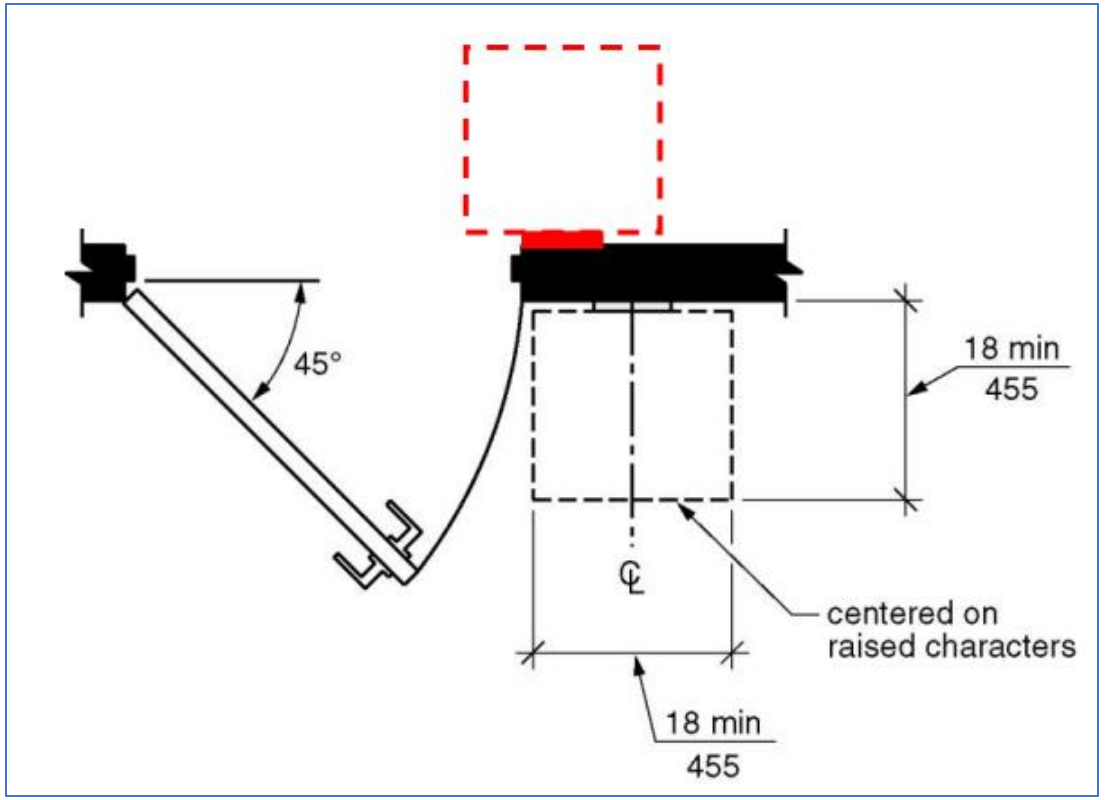
Number of Doors in Doorway	Number of Active Leaves	Sign Location
None	None	to the right of the doorway[1]
1	1	on the latch side[1]
		permitted on the door where the door swings inward, has a closer, and does not have a hold-open device
2	1	on the inactive leaf
2	2	on the right-hand leaf where the door swings inward, has a closer, and does not have a hold-open device
		to the right of the right-hand leaf[1]

1. Where there is no wall space signs shall be on the nearest adjacent wall.

~~Clear Floor Area~~ → "Standing Space"

This drawing is from the Access Board technical guidance on signage.





"A standing space 18 inches (455 mm) minimum by 18 inches (455 mm) minimum shall be provided and shall be centered on the raised characters. The arc of any door swing between the closed position and a 45-degree open position, shall not swing into the standing space."

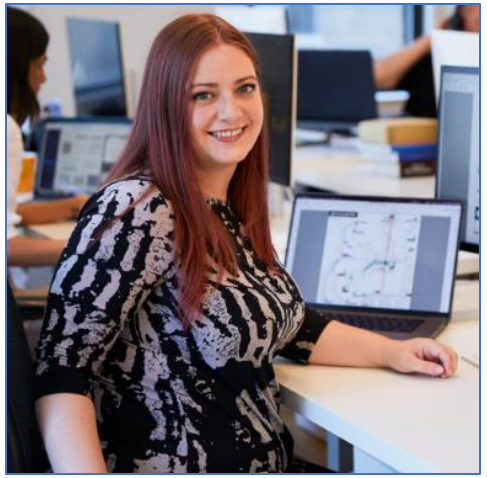
Next Steps

Next Steps

- Look for ISA & SEGD member alerts as A117.1 standard is finalized
- Additional education at ISA International Sign Expo, SEGD Annual Conference, and meetings of our local chapters & affiliate associations
- Ask ISA staff for additional guidance interpreting and applying A117.1 rules

Thank You

Any Questions?



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